OPERATING SUMMARY

LAKEVIEW

water pollution control plant

1968

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

D. S. Caverly,
General Manager.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

LAKEVIEW

water pollution control plant

operated for

THE TOWNSHIP OF TORONTO

and

THE MUNICIPALITY OF METROPOLITAN TORONTO

by

THE ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

CONTENTS

'68 REVIEW

The flow increased by approximately 19 percent over the 1967 flow. The average daily flow of 11.7 mgd was the same as the previous year.

The BOD and suspended solids removal increased although the influent BOD and suspended solids remained in the same range. The effluent BOD and suspended solids were low considering the amount of sewage being treated at this plant.

An agreement has been signed between the Commission and all municipalities in Southern Peel County for area sewage treatment. Under this arrangement the Lakeview plant will become a provincial facility and will be greatly expanded to meet the needs of the area.

PROJECT STAFF

The plant staff at the end of the year consisted of a superintendent, a chief operator, four operators and three labourers. Also employed are a chief mechanic, two mechanics, one electrician and one helper.

MAINTENANCE

No major problems developed during the year and routine maintenance was performed.

PROJECT COSTS

NET CAPITAL COST (Final):		
Metro Toronto	$1,609,455.99	
Toronto Township	275,173.85	$1,884,629.84
Deduct Portion Financed by CMHC (Final-Metro only)		185,877.58
Long Term Debt to OWRC		$1,698,752.26
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968:		
Metro Toronto	$ 215,563.89	
Toronto Township	85,281.75	$ 300,845.64

The total cost to the municipalities during 1968 was as follows:

Net Operating		
Metro Toronto	$ 170,007.47	
Toronto Township	119,420.26	$ 289,427.73
Debt Retirement		
Metro Toronto	$ 24,525.00	
Toronto Township	9,738.00	34,263.00
Reserve		
Metro Toronto	$ 6,774.05	
Toronto Township	2,337.46	9,111.51
Interest Charged		
Metro Toronto	$ 68,243.86	
Toronto Township	27,099.42	95,343.28
TOTAL		$ 428,145.52

RESERVE ACCOUNT

Balance @ January 1, 1968		
Metro Toronto	$58,086.77	
Toronto Township	19,314.43	$77,401.20
Deposited by Municipalities		
Metro Toronto	$ 6,774.05	
Toronto Township	2,337.46	9,111.51
Interest Earned		
Metro Toronto	$ 3,510.64	
Toronto Township	1,161.91	4,672.55
		$91,185.26
Less Expenditures		
Metro Toronto	$ 2,536.80	
Toronto Township	1,087.20	3,624.00
Balance @ December 31, 1968		$87,561.26

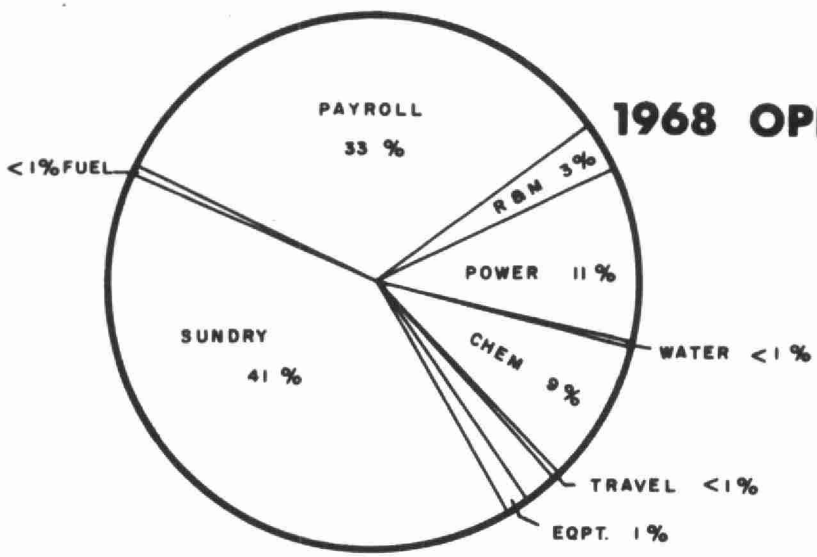
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	15141.67	6367.95	-	-	2504.08	-	348.31	273.27	388.67	5127.58	83.48	48.33
FEB	24100.38	5443.19	213.66	157.33	2581.63	-	329.02	317.71	461.69	14540.52	34.20	21.43
MAR	20810.48	9978.01	486.36	-	2511.97	-	688.35	99.37	651.44	6347.67	31.95	17.36
APRIL	19892.72	6843.94	343.35	-	2312.06	-	621.98	352.88	188.50	9171.27	45.30	13.44
MAY	16705.60	6118.46	298.23	-	2340.06	4110.75	449.14	1163.11	1235.27	900.55	85.55	4.48
JUNE	28258.41	6017.55	1162.13	-	2337.23	-	390.81	233.13	398.93	17522.20	71.11	125.32
JULY	31515.98	5348.33	1434.09	-	2809.67	-	643.58	195.41	645.94	20257.87	112.64	68.45
AUG	20872.71	8686.99	1385.90	-	4.00	-	443.87	267.60	2216.60	7867.75	-	-
SEPT	13100.07	5687.78	504.53	-	5309.36	-	438.97	228.25	39.03	296.14	475.66	120.35
OCT	25936.18	5430.69	561.90	226.93	2667.13	-	785.83	155.17	296.38	15512.43	257.25	42.47
NOV	20353.16	5359.53	753.52	-	2717.27	6394.50	422.45	91.82	1223.18	3259.59	91.71	39.59
DEC	52740.37	14546.58	152.66	56.93	2892.97	14376.60	1351.79	174.86	2183.75	17198.33	(271.95)	77.85
TOTAL	289427.73	85829.00	7296.33	441.19	30987.43	24881.85	6914.10	3550.58	9929.38	118001.90	1016.90	579.07

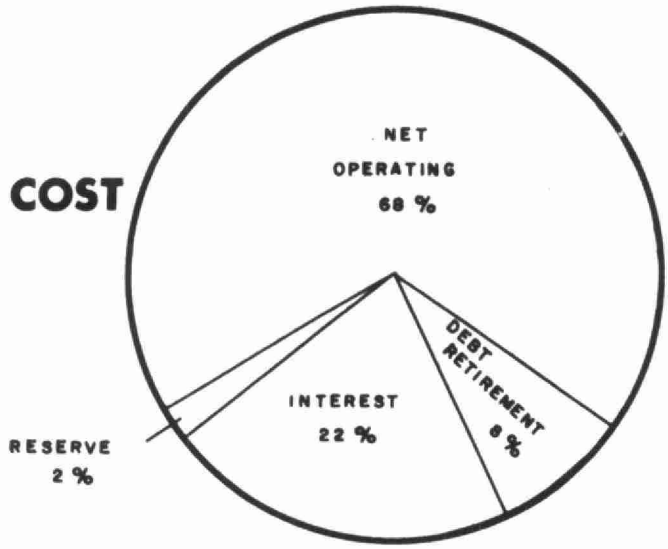
*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $91,296.22

BRACKETS INDICATE CREDIT

1968 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	2358.700	$159,678.00	$67.69	3 cents
1965	2623.254	140,366.45	53.51	2 cents
1966	2907.316	156,970.50	53.99	3 cents
1967	3595.113	187,867.51	52.26	3 cents
1968	4265.962	289,427.73	67.85	3 cents

Process Data

FLOWS

The flow from Metropolitan Toronto was 2493.35 million gallons, an increase of 7.9 percent over 1967. The flow from the Town of Mississauga was 1592.51 million gallons, an increase of 30 percent over 1967. The flow from the Town of Port Credit was 180.10 million gallons, almost unchanged from the 1967 flow.

The total flow for 1968 was 4265.96 million gallons, an increase of 19 percent over 1967 flows.

PROBABILITY OF FLOWS

The plot demonstrates that for 88 percent of the time flows exceeded the plant's design capacity, and for 20 percent of the time they exceeded 150 percent of design capacity. Flows exceeded twice the plant's capacity three percent of the time.

OPERATING RESULTS

The treated effluent quality seldom met Commission objectives of 15 mg/l for both BOD and suspended solids owing to heavy overloading.

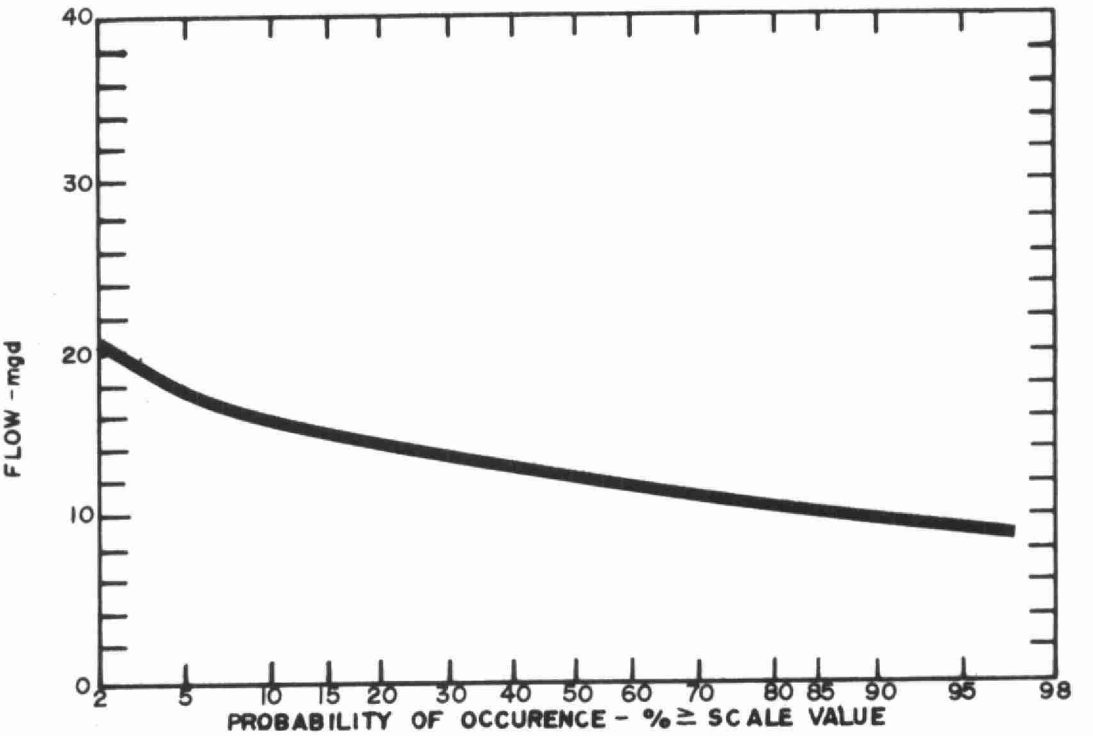
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10^4 lbs.	DOSAGE mg/l
JAN	314.4	10.1	19.8	7.7	1.14	3.6
FEB	351.7	12.1	25.9	7.1	1.51	4.3
MAR	368.0	11.9	17.2	7.6	1.93	5.2
APR	307.6	10.3	16.2	8.0	1.63	5.3
MAY	341.8	11.0	14.5	7.1	1.71	5.0
JUN	331.6	11.1	13.1	7.2	1.48	4.5
JUL	320.8	10.3	13.2	7.6	1.48	4.6
AUG	358.0	11.5	24.1	7.5	0.99	2.8
SEPT	409.8	13.7	22.3	9.1	1.46	3.6
OCT	364.4	11.8	16.6	9.0	2.02	5.5
NOV	386.8	12.9	22.8	8.5	1.95	5.0
DEC	411.2	13.3	20.6	9.8	1.62	3.9
TOTAL	4266.0	-	-	-	18.92	-
AVERAGE	-	11.7	-	-	1.58	4.4

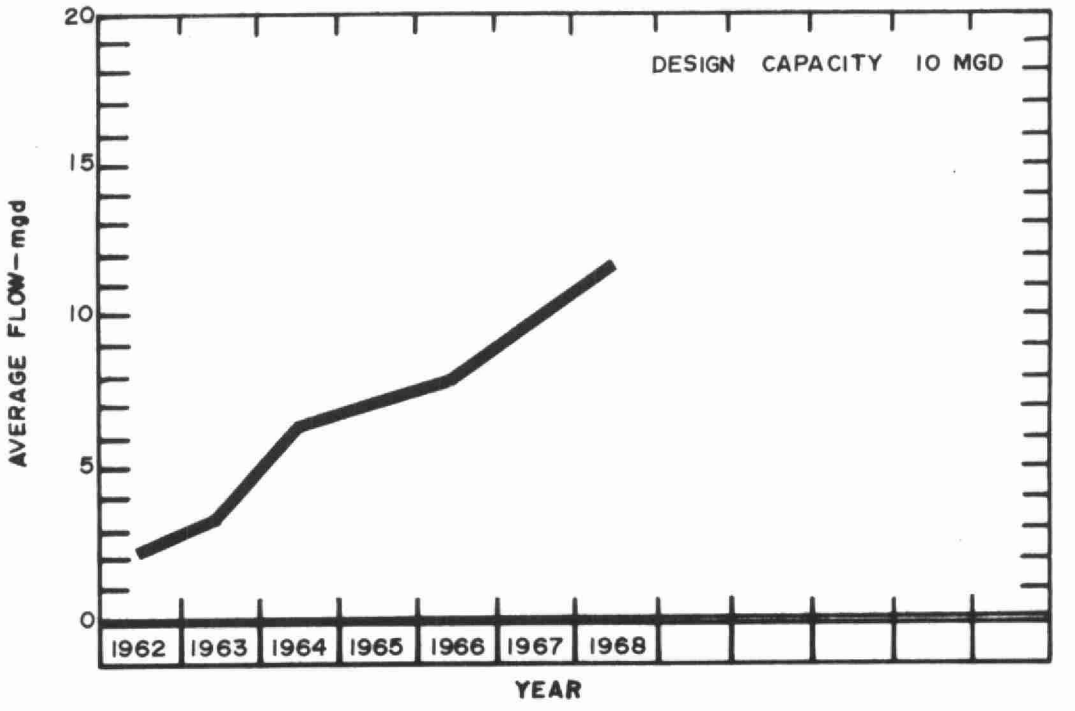
COMMENTS

The total flow for the year was 4266 million gallons. The average daily flow was 11.7 million gallons, while the maximum and minimum flows were 25.9 million gallons and 7.1 million gallons.

Chlorination of the effluent occurred throughout the year. A total of 189,200 pounds of chlorine or an average of 0.28 pounds per million gallons was used to give an average dosage of 4.4 mg/l in the effluent.


40
30
20
10
0
FLOW - mgd
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

FLOWS


20
15
10
5
0
AVERAGE FLOW - mgd
DESIGN CAPACITY 10 MGD
1962
1963
1964
1965
1966
1967
1968
YEAR

FLOW DATA

Month	Total Flow (MG)	Metro Flume (MG)	Tor. Twp. Port Credit (MG)	Port Credit (MG)	Beach Street (MG)	Secondary (MG)
January	314.423	193.741	108.313	12.369	37.411	314.223
February	351.723	205.449	132.859	13.415	42.846	341.245
March	367.960	202.869	149.064	16.027	45.472	339.474
April	307.573	184.187	107.362	16.024	43.070	305.031
May	341.785	202.076	124.057	15.652	41.799	324.875
June	331.610	202.938	113.240	15.432	40.921	330.612
July	320.750	194.320	111.032	15.398	40.895	317.790
August	357.960	212.782	128.758	16.420	44.861	353.247
September	409.813	246.484	146.728	16.601	48.572	375.751
October	364.425	216.443	134.099	13.883	42.560	325.852
November	386.780	222.787	150.033	13.960	47.190	336.393
December	411.160	209.278	186.961	14.921	48.985	397.521
Total	4265.962	2493.354	1592.506	180.102	524.582	

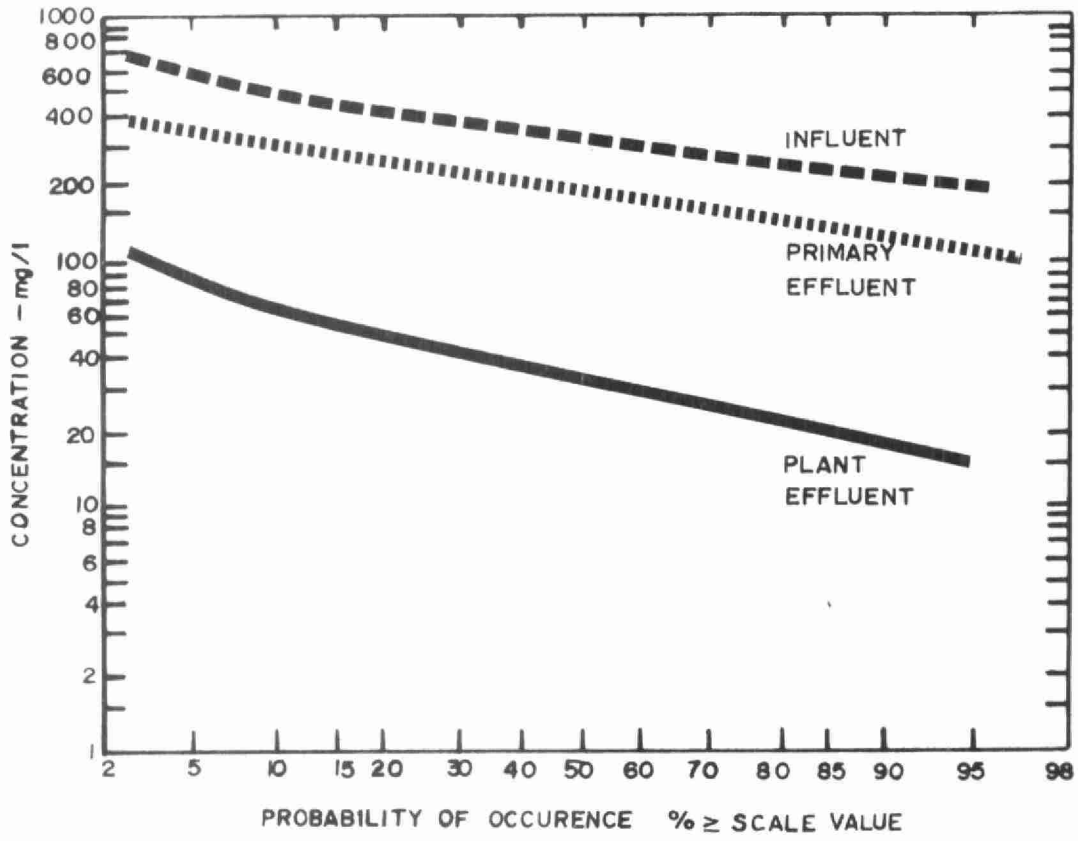
AERATION

MONTH	AVERAGE FLOW mgd	PRIMARY EFF		SECONDARY EFF		MLSS CONC^N mg/l	F/M (lb BOD / lb MLSS)	AIR USED (1000 ft^3 / lb BOD REMOVED)	WASTE SLUDGE 10^5 lb
		BOD CONC^N mg/l	SS CONC^N mg/l	BOD CONC^N mg/l	SS CONC^N mg/l				
JAN	10.1	159	207	16	22	1,850	0.28	.95	5.48
FEB	11.8	167	161	24	36	1,910	0.33	.81	5.34
MAR	11.0	180	151	61	65	3,630	0.17	.95	4.23
APRIL	10.2	214	164	37	48	1,580	0.44	.77	5.63
MAY	10.5	187	180	42	48	1,050	0.67	.90	3.75
JUN	11.0	213	200	41	47	1,180	0.79	.70	7.46
JUL	10.3	149	150	24	37	1,260	0.41	1.07	3.48
AUG	11.4	112	116	8	13	1,420	0.29	1.08	2.75
SEPT	12.5	133	119	13	24	1,730	0.32	.88	2.84
OCT	10.5	226	157	37	58	2,170	0.39	.72	6.70
NOV	11.2	197	157	35	52	1,550	0.50	.77	5.28
DEC	12.8	179	131	21	25	1,660	0.44	.68	3.58
TOTAL	-	-	-	-	-	-	-	-	56.52
AVERAGE	11.1	176	158	30	40	1,750	0.42	0.86	4.71

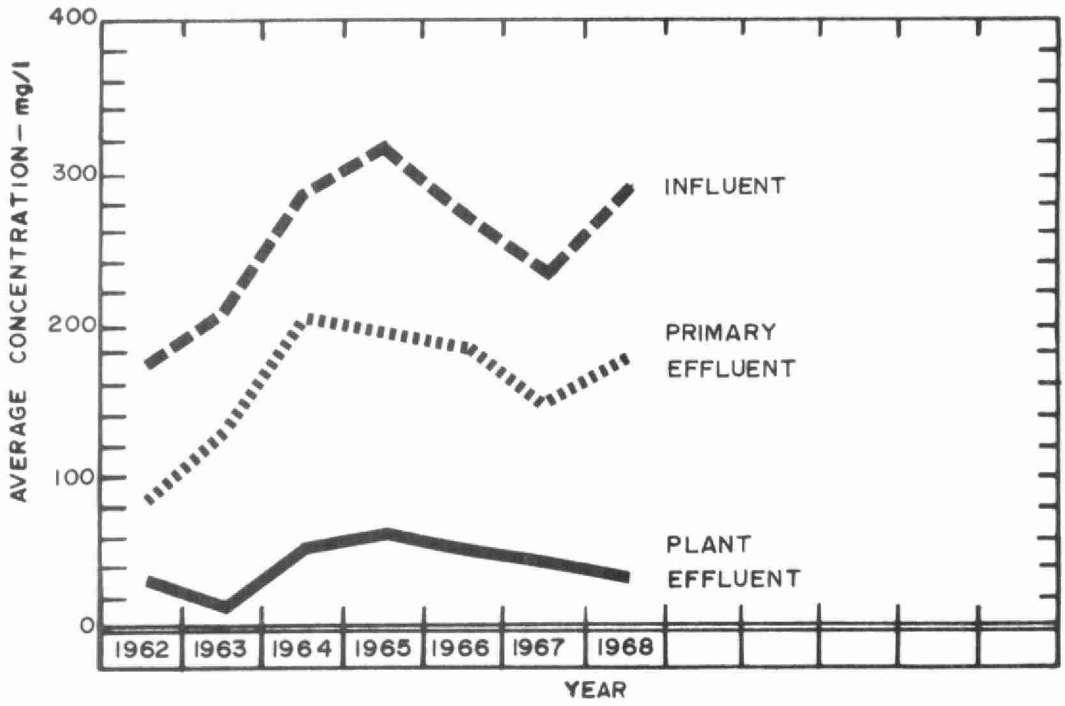
COMMENTS

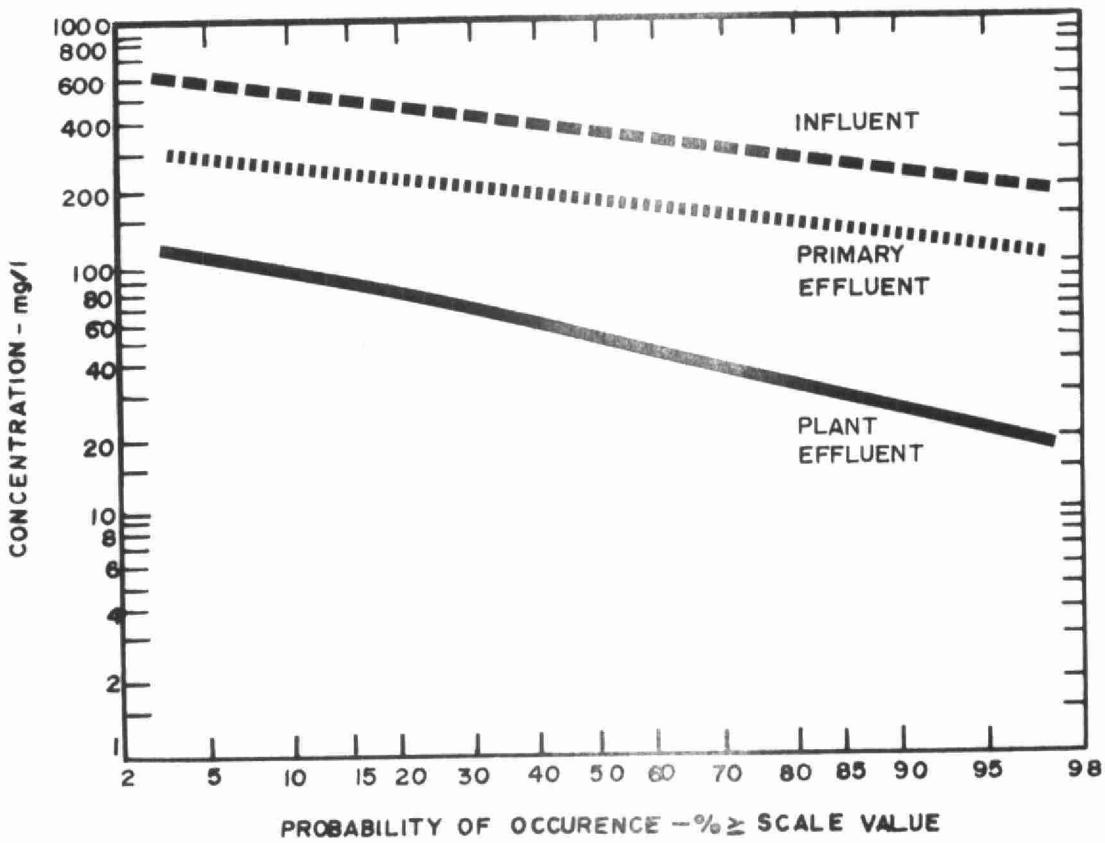
The average flow to the aeration section was 11.1 mgd. BOD and suspended solids removal in the aeration section was good, with 83 percent BOD and 75 percent suspended solids removal.

The average F/M ratio of 0.42 pounds of BOD per pound of MLSS was slightly less than the 1967 value. However, it was still high.

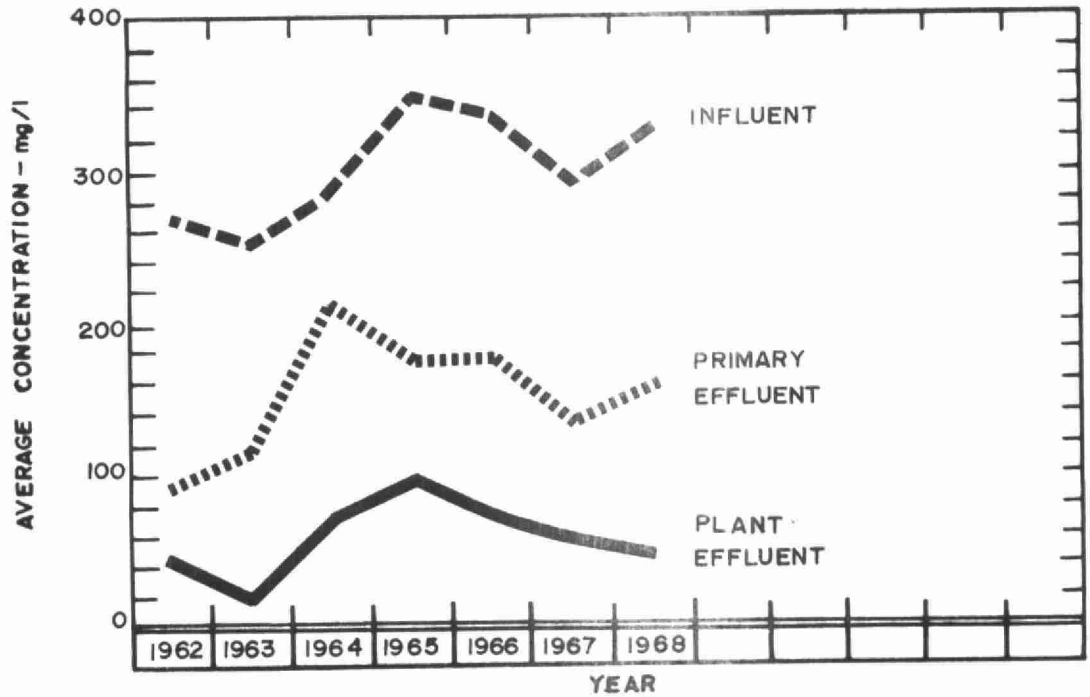


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



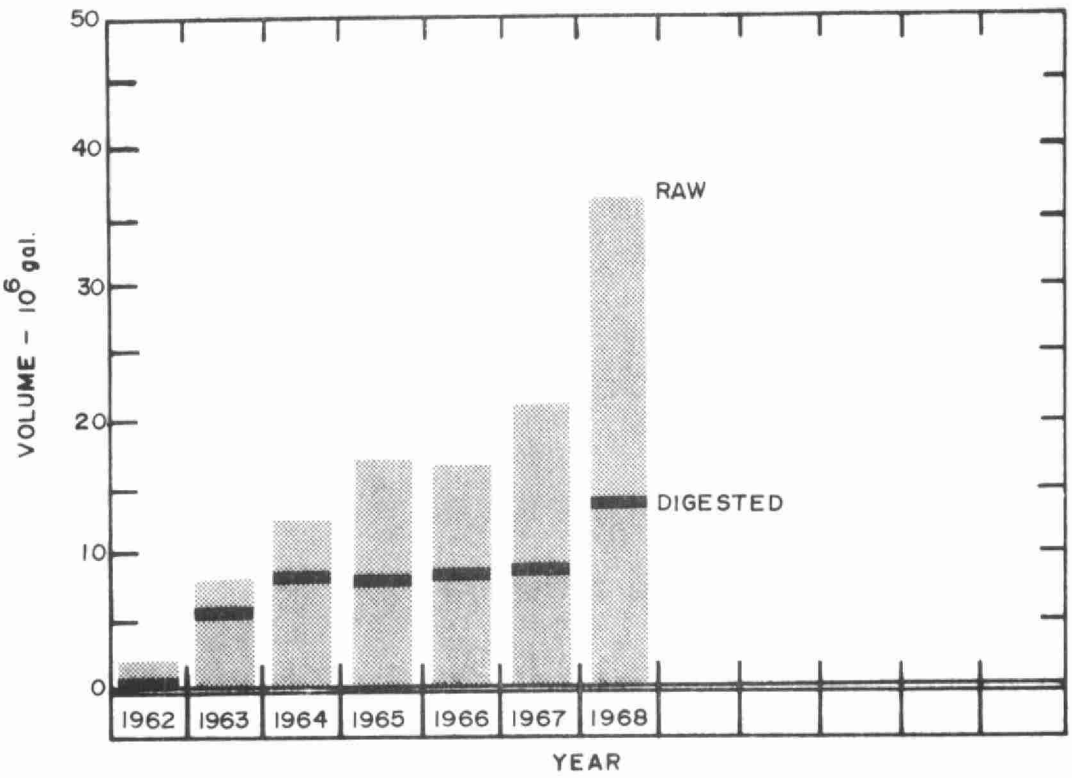
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL lb	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL lb	REMOVAL ft^3
JAN	205	18	91	5.88	360	22	94	10.63	300
FEB	250	22	91	9.02	345	35	90	10.91	340
MAR	275	89	68	6.84	298	69	77	8.42	350
APR	401	54	86	10.67	366	45	88	9.87	435
MAY	295	35	88	8.88	366	48	87	10.87	230
JUN	333	42	87	9.65	332	44	87	9.54	400
JULY	280	24	91	8.21	319	38	88	9.01	280
AUG	191	9	95	6.52	242	14	94	8.16	460
SEPT	253	15	94	9.76	286	22	92	10.81	575
OCT	355	45	87	11.29	359	66	82	10.67	320
NOV	323	49	85	10.59	361	56	84	11.80	340
DEC	294	26	91	11.02	267	31	88	9.70	270
TOTAL	-	-	-	107.33	-	-	-	120.39	4300
AVERAGE	288	36	88	8.94	325	41	87	10.03	358

COMMENTS

The average for BOD and suspended solids in the influent was 288 mg/l and 325 mg/l. The average BOD and suspended solids in the effluent was 36 mg/l and 41 mg/l. These results gave an average efficiency of 88 percent BOD and 87 percent suspended solids removal.

A total of 4300 cubic feet of grit was removed during the year.


50
40
30
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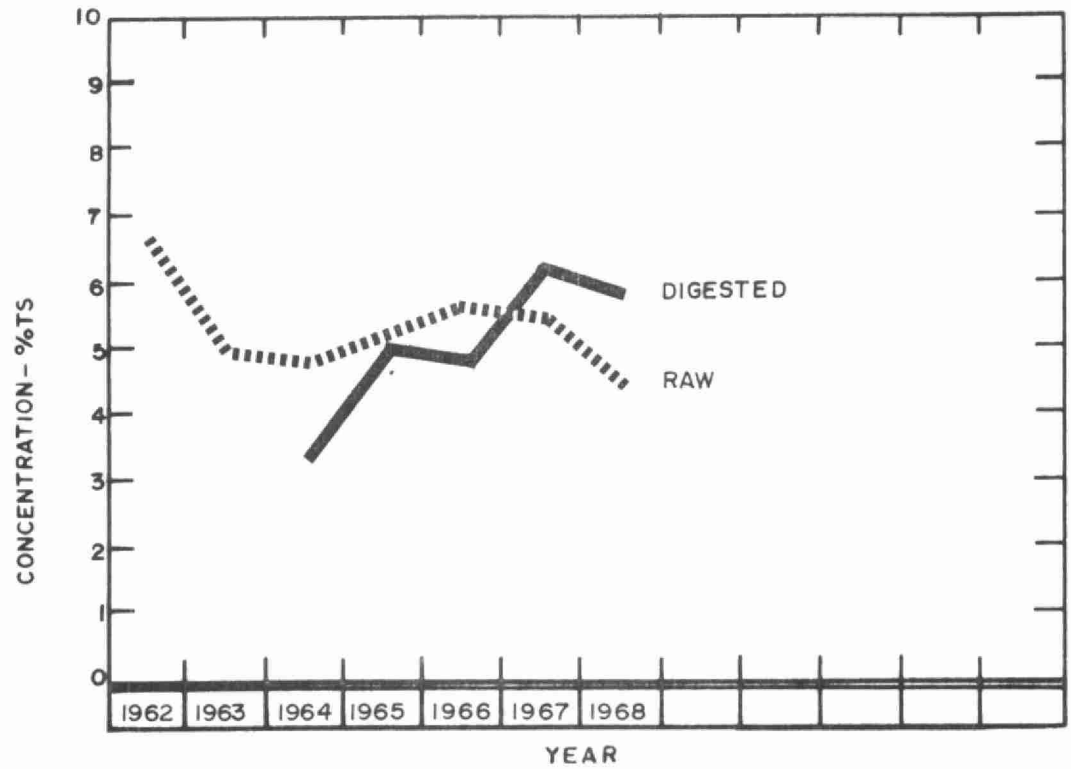
VOLUME - 10^6 gal.
RAW
DIGESTED
1962
1963
1964
1965
1966
1967
1968
YEAR

DIGESTION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CONCENTRATION - %TS
DIGESTED
RAW
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1963
1964
1965
1966
1967
1968
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^6 gal	T. S. %	V. S. %	VOLUME 10^6 gal	T. S. %	V. S. %	VOLUME gal	T. S. %	LIQUID 10^3 yd^3	DEWATERED yd^3
JAN	1.90	5.1	62	0.84	5.8	45	-	0.5	5.08	284
FEB	2.36	6.3	59	0.93	6.4	43	-	2.3	5.03	487
MAR	3.35	4.6	59	1.29	5.9	45	-	1.9	7.76	0
APR	2.67	4.1	65	1.15	6.8	46	-	0.7	6.82	0
MAY	3.00	4.2	66	1.11	6.1	49	-	2.3	6.57	0
JUN	2.84	4.4	63	1.11	6.0	47	-	1.1	6.62	0
JUL	3.31	3.8	63	1.15	7.1	47	-	0.5	6.83	0
AUG	2.73	3.8	61	1.18	5.9	47	-	0.6	7.01	0
SEPT	3.02	4.5	62	1.06	6.8	43	-	0.5	6.27	0
OCT	3.79	4.2	66	1.21	5.1	47	-	1.0	7.15	0
NOV	4.11	3.9	64	1.63	4.2	48	-	1.2	9.66	0
DEC	3.97	3.6	65	1.90	5.0	47	-	0.7	11.28	0
TOTAL	37.05	-	-	14.56	-	-	-	-	86.08	771
AVERAGE	3.08	4.4	63	1.21	5.9	46	-	1.1	7.18	-

COMMENTS

There were 37,040,000 gallons of raw sludge pumped to the digesters in 1968. Liquid sludge disposal totalled 86080 cubic yards or 14,504,480 gallons. This gave a 61 percent reduction in volume from input to sludge removed.

The average volatile solids reduction was 50 percent for 1968. This is an increase of 13.2 percent over 1967.

CONCLUSIONS

The design capacity of the plant was realized throughout the year, and the results obtained were as good as could be expected.

Plans for plant expansion continued during 1968, and it is anticipated that by fall of 1969 construction will be under way.

The average daily flow exceeded the design capacity throughout the year.

Water management in Ontario